



U.S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: Action: Review and Concurrence, Equivalent Level of Safety Finding for Gulfstream Models GV-SP and GIV-X FAA Project Number Nos. AT5177AT-T and AT5080AT-T, respectively.	Date: August 28, 2003
From: Manager, Airframe & Cabin Safety, ANM-115	Reg. Ref: §§ 25.811(d), 25.812(b)
To: Manager, Atlanta ACO, ACE-115A	Reply to Attn of: Joe Jacobsen, ANM-113
	ELOS Memo #: AT5177AT-T-C-1

Background

The GIV-X and GV-SP airplanes are certified for a maximum passenger capacity of 19. Both model airplanes have a Type I entry door on the left side of the fuselage and a pair of overwing elliptical exits on both sides of the fuselage.

Gulfstream Aerospace Corporation (GAC) has installed exit marker, locator and bulkhead/divider signs, which are 1.5 X 4.75 inches with 1 inch high red letters, on GIV-X and GV-SP airplanes. These signs are electrically illuminated. Section 25.812(b)(1) requires these signs, when installed on airplanes with passenger seating configurations of 10 or more, to have a specific background area and letter height. Section 25.812(b)(2) requires these signs, when installed on airplanes with passenger seating configurations of 9 or less, to have a specific background height and letter height. The signs installed by GAC do not meet the background area and letter height requirements of § 25.812(b)(1) and do not meet the background height requirement of § 25.812(b)(2).

GAC has also combined the exit locator sign and exit marker sign into one sign by utilizing two 1.5 X 4.75 inch electrically illuminated exit signs on a wedge mounting base. The wedge shape of this sign allows it to be viewed from forward and aft of the sign, thus enabling it to function as the locator sign, and also from inboard of the sign, thus allowing it to function as the marking sign. Two of these signs will be installed at the elliptical overwing exits (one each on the left and right side of the fuselage) and have been demonstrated to meet §§ 25.811(d)(1) and 25.811(d)(2).

Applicable regulation(s)

§§25.811(d) and 25.812(b)

Regulation(s) requiring an ELOS

§25.812(b) at Amendment 25-88

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

The certification bases for the GV-SP and GIV-X model airplanes require compliance with 14 CFR §§ 25.811(d) and 25.812(b) at Amendment 25-88. These paragraphs have not changed since Amendment 25-32, which is earlier than the GIV certification basis for these sections. A similar ELOS finding has been granted previously for the GIV and GV model airplanes. As with the current proposal, the lighting intensity and color requirements of the regulations were maintained for the ELOS for the GIV and GV.

Previous ELOS findings, which allow the installation of smaller exit signs, have been found acceptable for specific airplanes based on their passenger cabin aisle lengths and fuselage diameters.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

The FAA considers that it is acceptable to use the proposed wedge shaped exit locator/marker sign to demonstrate compliance with §§ 25.811(d)(1) and 25.811(d)(2) on GIV-X and GV-SP airplanes.

The proposed signs were evaluated by the FAA on representative interior installations. The legibility of the exit marker, locator and bulkhead/divider signs were confirmed by person(s) with 20/20 (or worse) eyesight. It was determined that the signs are legible by occupants ranging from 5th percentile (in height) female (approximately 5' 2") to a 95th percentile (in height) male (approximately 6' 1"). The evaluation of each marker sign was accomplished from a standing position in the aisle opposite the exit. The evaluation of each locator and bulkhead/divider sign was accomplished from all standing locations in the aisle, forward or aft of the sign, as appropriate. The signs were illuminated during the evaluation.

The sign's background area and height is substantially less than required by §§ 25.812(b)(1) and 25.812(b)(2), respectively. This could result in insufficient color contrast between the sign's letters and its background area due to the surrounding airplane surface acting as the background area. In order to ensure legibility of the word "EXIT", the interior compliance evaluation must consider either two worst case scenarios of background color, or the existing background color but be subject to re-evaluation per a limitation on the STC every time the background color changes. For the worse case scenario option, the first evaluation must be conducted with an aircraft background color that is the same color as the sign's letters (representing the worst case for a lighted cabin). The second evaluation must be conducted with an aircraft background color of black (representing a dark cabin).

The illumination levels of the signs were shown to meet the requirements of § 25.812(b).

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned Equivalent Level of Safety Finding for both the GV-SP and the GIV-X in Issue Paper C-1. This memorandum provides standardized documentation of the ELOS that is non-proprietary and can be made available to the public. The Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's) or on page 3 of the STC Certificate. [e.g., equivalent safety findings have been made for the following regulation(s): § 25.811(d) Emergency Exit Marking, and § 25.812(b) Emergency Lighting (documented in TAD ELOS Memo No. AT5177AT-T-C-1)].

Original signed by Franklin Tiangsing

1/14/04

Manager, Airframe & Cabin Safety, ANM-115

Date

ELOS Originated by: Atlanta ACO	Program Managers: Carla Wendler (GIV-X) & Neil Berryman (GV-SP)	Routing Symbol: ACE-115A
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